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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/832,626	04/11/2001	R. G.F. Visser	294-52 CIP	1804

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EXAMINER

MCINTOSH III, TRAVISS C

ART UNIT	PAPER NUMBER
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1623

DATE MAILED: 03/26/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/832,626

Applicant(s)

VISSER ET AL.

Examiner

Traviss C McIntosh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 1-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

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DETAILED ACTION

The Amendment filed January 6, 2003 has been received, entered into the record, and carefully considered. The following information provided in the amendment affects the instant application by:

Claims 16 and 18-21 have been amended.

Remarks drawn to rejections of Office Action mailed August 27, 2002 include:

Claim objections, which have been overcome by applicant's amendments. Objections have been withdrawn.

112 2nd paragraph rejections which have been overcome by applicants' amendments. 112 2nd rejections have been withdrawn. A new 112 2nd paragraph rejection is set forth below which is necessitated by the recent amendment.

102(b) rejection which has been overcome by applicant's introduction of additional limitation drawn to the type of starch.

103(a) rejection which has been maintained for reasons of record.

An action on the merits of claims 16-21 is contained herein below. The text of those sections of Title 35, US Code which are not included in this action can be found in a prior Office action.

Information Disclosure Statement

Receipt is acknowledged of Information Disclosure Statement files January 6, 2003, however no references were made available to the Examiner. The Examiner will consider the

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foreign patent documents and non-patent references when they are made available to the Examiner.

Claim Rejections - 35 USC § 112

Originally presented product claim 20 initially and correctly depended from product claim 19. As amended, product claim 20 now improperly depends from the method claim 16. Claim 20 should be amended to exhibit proper dependence or be canceled.

Claim Rejections - 35 USC § 103

The rejection of claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verberne et al. (US Patent 3,890,888) in view of Mitchell et al. (US Patent 4,285,735) and further in view of Tallberg et al. (US Patent 5,824,798) is maintained for reasons of record.

The claims of the instant invention are drawn to a method of isolating starch from a tuber plant comprising: washing the tuber followed by grating then milling, separating the starch from fibers and juice in a separator, sieving the starch, washing the starch in a hydrocyclone, and drying the starch in a vacuum filter followed by a drying tower. The recitation of the starch product having an amylopectin content of at least 95% weight based on the weight of the starch has no patentable import on the process of isolating the starch as claimed. This recitation is merely a property of the product produced and is not seen as a limitation of the process of isolating the starch as claimed.

Verberne et al. teaches of a method of recovering starch from root crops, such as cassava tubers and potatoes (column 1, lines 5-10) wherein the grating normally takes place at least twice

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(column 1, lines 27-28). The grated substance is then separated by means of hydrocyclones into juice mixed with fibers on one hand, and starch on the other. The starch fraction then undergoes filtration (sieving) and finally is purified by washing in a stream of fresh water in a second hydrocyclone (column 2, lines 51-62). What is not taught by Verberne et al. is to wash the tuber initially, to use a milling device, or to dry the product twice, however the Mitchell et al. patent addresses the use of a milling device and the Tallberg et al. patent addresses drying techniques for polysaccharide polymers isolated from tubers.

Mitchell et al. teach of a process for isolating a plant starch from the dahlia tuber (abstract). Analogous to starch, inulin is chiefly a fructose polymer based polysaccharide starch (column 1, lines 36-38). The process as taught by Mitchell et al. involves the isolation of a polysaccharide component by washing and scrubbing a tuber and grinding in any conventional hammer mill or grinder. The slurry produced is then filtered through a filter cloth to remove fibrous insolubles (column 2, lines 31-34 and column 3, lines 34-40) and the products are further derivatized as dictated by the patent.

Tallberg et al. teach of a process for isolating amylopectin-type starch from a tuber (column 1, lines 10-11). The process as taught by Tallberg et al. comprises, grating a potato, thereby releasing the starch from the cell wall, separating the fibers from the starch in centrifugal screens, then separating the starch from the juice in a hydrocyclone followed by a band-type vacuum filter. The product is then dried in two steps, first by pre-drying on a vacuum filter and subsequently by final drying in a hot air current (column 9, lines 21-35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the washing and milling steps of Mitchell et al. as the precursor steps in

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Verberne et al's starch isolation procedure because Verberne et al. teach to grate the tuber at least twice. One would be motivated to incorporate a milling technique in place of a grating step as it is known in the art that multiple gratings break the cell walls down to a size so small that the resulting fine fiber is not easily separated in the hydrocyclone or in sieving. One would be motivated to wash the tuber before use because one of ordinary skill in the art would recognize that there could be chemicals on the tuber if purchased from a supplier, or if a fresh tuber was picked from the earth, one would want to wash off any soil and residue from the tuber's outer surface to eliminate as many impurities as possible during starch isolation from a tuber. Washing a tuber before use and incorporating a step that would allow for the cells to maintain a more desirable size would be obvious to one of ordinary skill in this art.

It would have been obvious of one of ordinary skill in the art at the time the invention was made to incorporate the drying steps of Tallberg et al. into the process as taught by Verberne et al. in view of Mitchell et al. as noted above as these are just variations of standard drying techniques known in the industry. One would be motivated to incorporate these drying steps into the prior art process because these steps would allow for a crystallized product that could then be diluted to various levels based on the needs of the application.

Applicant's arguments filed January 6, 2003 have been fully considered but they are not persuasive.

It is noted, on page 5, lines 8-9 of the instant disclosure, that starch isolating procedures are to be carried out in a manner essentially similar to methods used for isolating starch from potato tubers. This directs the examiner to prior art directed to starch extraction from potatoes and related tuber plants. To apply general extraction procedural steps of the prior art to a

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recognized starting material such as a tuber, and to determine optimum conditions of operation from processing has been held not to involve patentable invention. Potatoes and cassavas are known members of starch producing roots. The use of cassava in place of potatoes in starch isolation procedures is indeed obvious in view of the art of record. Indeed, the prior art of record does suggest all of the claim limitations when Verbene et al. process steps are considered in view of Mitchell et al. and Tallberg et al. tuber processing steps.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kossmann et al. (Kossmann) (US Patent 6,207,880 B1) and Shewmaker et al. (Shewmaker) (US Patent 5,349,123).

The claims of the instant application are product by process claims wherein the process limitations have no patentable import on the product claimed. The claims are read as a cassava starch wherein the starch has an amylopectin content of at least 95% by weight, or at least 98% by weight based on the dry weight of the starch.

Shewmaker is directed to the general state of the art, wherein it is taught that starches from different plants or plant parts often have different properties. In some species, mutants have been identified which have altered contents of amylose and amylopectin. Mutations that affect the starch content in peas result in seeds having less starch and a lower proportion of amylopectin. Similarly, a potato mutant has been identified whose starch is amylose free

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(column 1, lines 52-66). Shewmaker further adds that with the development of genetic engineering techniques, it is possible to transfer genes from a variety of organisms into the genome of a large number of different plant species, thus it is desirable to develop plant varieties through genetic engineering, which have an increased capacity for starch synthesis, altered amylose/amylopectin ratios, and other alterations wherein the mutated starches would be useful with a variety of viscosity or texture differences (column 2, lines 3-19).

Kossmann teach of a starch which was isolated from potato plants in which the amount of proteins in the cells was reduced due to an antisense effect in combination with a reduction of proteins exhibiting the enzymatic activity of a starch granule-bound starch synthase of the isotype I (GBSSI) exhibits characteristics which strongly deviate from the wild-type starch. The amylose/amylopectin content of the starch is characterized that almost no amylose is detected and the amylose content is preferably below 5% and more preferably below 2% (column 10, lines 30-46). Further, DNA sequences encoding a GBSSI from potato are known, and the methods of modifying the amylose/amylopectin content of the starch may be used for any kind of plant species, including cassava and potatoes (column 1, lines 3-12).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the transformation techniques of Kossmann to modify cassava to obtain an essentially amylose-free starch. Genetic changes are contemplated by both Kossmann and Shewmaker to provide a starch with modified amylose/amylopectin ratios. With the mutant cassava as the starch source, and tuber processing techniques which are known in the art and admitted on the record to be equivalent to potato processing, one would obtain an essentially amylose-free cassava starch. One would be motivated to combine these teachings as one would

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obtain a modified starch with a varying degree of starch branching, which has varied physical properties and which could result in the production of polymers with new applications (Shewmaker – column 1, line 66 – column 2, line 2).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

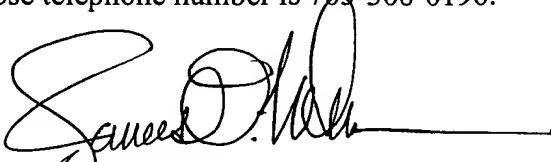
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Traviss C McIntosh whose telephone number is 703-308-9479. The examiner can normally be reached on M-F 8:30-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 703-308-4624. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.



James O. Wilson
Supervisory Patent Examiner
Art Unit 1623

Traviss C. McIntosh
March 18, 2003